Defense Information Systems Agency

A Combat Support Agency

Computing Services: Today and Tomorrow

Alfred J Rivera
Director, Computing Services
20 April 2009

DISA
A Combat Support Agency

Our World Today

Changes in the underlying platform enable Web 2.0 – blogs, wikis, social networking

- **Agility/flexibility of technology – implying a power shift**
- **Always on – ubiquitous**
- **Real time information and immediate feedback**
- **Provides**
  - **New distribution channels**
  - **Early warning through the blogosphere**
  - **Radical transparency**
  - **Dynamic, ad hoc sharing and collaboration**

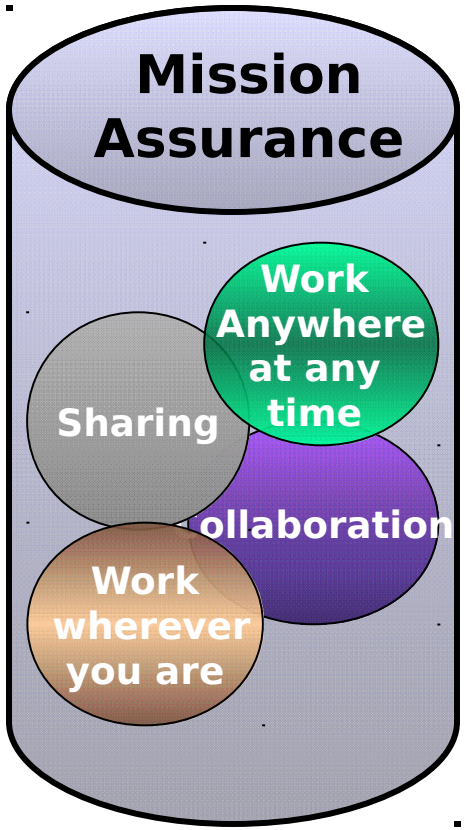
Presenting challenges for the ‘institution’

DISA
A Combat Support Agency

Congruent and Converging Forces…that compete

- **If you accept…**
  - **There is an unquenchable thirst for collaboration and sharing**
  - **We can work anywhere at any time – highly mobile workforce**
  - **You can work wherever you are – at home, traveling, etc.**

- **Then…**
  - **How do we achieve mission assurance on the same network?**
  - **How do we ensure the network is there when we need it?**
  - **What approach should we take?**



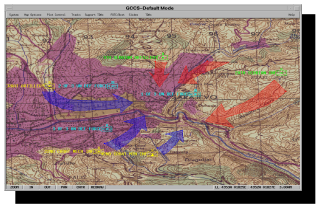
The enterprise never relaxes

Computing Support for the Warfighter

DISA

A Combat Support Agency

Maintenance



Command and Control

C2 & Information Sharing

- Net-centric Enterprise Service
- Global Combat Support System (GCSS)
- Missile Defense Command & Control, Battle Management and Communications (C2BMC)
- Global Transportation Network (GTN)
- Theater Battle Management Core Systems

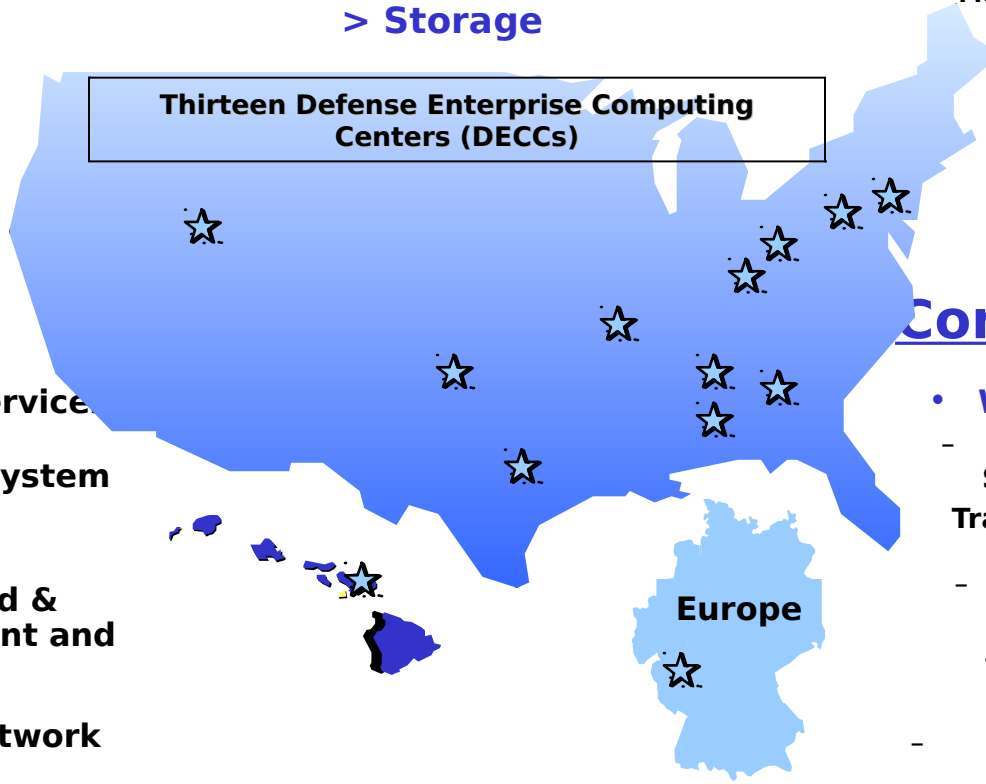
Critical Application Hosting

PROVIDING

> All classes of processing
> Systems management
> Communications
> Storage

Medical

Logistics



Recent DISA Establishment:

Theater Enterprise Computing Center – Bahrain (TECC-B)

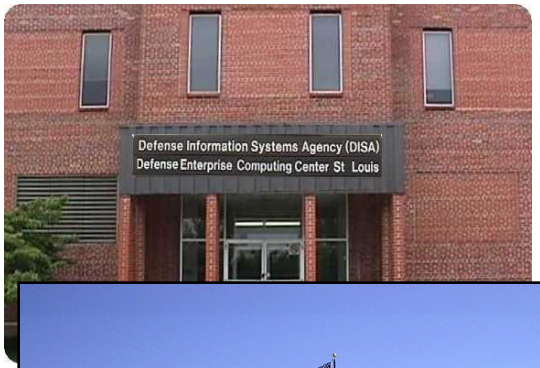
Combat Support

- **Warfighter Logistics**
  - Defense Distribution Standard System (DSS)
    Transportation and cargo movement
  - Combat requisition maintenance, mobility
- **Health & Medical Readiness**
  - Composite Health Care System II (AHLTA)
- **DoD Business and Financial**

DISA

A Combat Support Agency

DISA Computing Environment - Today



- **4,000,000+ users**
- **13 facilities**
- **445,000 sq ft raised fl**
- **34 mainframes**
- **6,100 servers**
- **3,800 terabytes of stora**
- **2,800 application/database instances**

DISA
A Combat Support Agency

The DECCs: Principal nodes of the GiG

- **Highly secure, scalable, computing and storage environments operated inside the DoD network**
  - **Highest level of network defense (DECCs are at the core)**
  - **Computer Network Defense compliant with IA policy**
- **High performance, high availability networks**
  - **Fully redundant and actively monitored networks**
  - **Directly connected to optical backbone**
- **Full support for NetOps essential tasks (important enabler of NetCentric operations)**
  - **Computer Network Defense (CND)**
  - **Enterprise management**
  - **Content management**

DISA
A Combat Support Agency

Attributes of DISA Computing

- **Built in**
  - Protection – aggressive computer network defense
  - Availability – redundancy, assured computing
  - Capacity – floor space, power, HVAC, processing, storage
  - Connectivity – redundant connection to the DISN core
- **Professional management**
  - NetOps foundations
  - Standards – and commercial best practices
  - Metrics – performance, cost, capacity, security
  - Efficiency – capacity on demand
  - IT Infrastructure Library (ITIL) framework – process, quality
- **Economical**
  - Lights out / lights dim operation
  - Benchmarked costs by Gartner
  - Governance under the Defense Working Capital Fund

DISA
A Combat Support Agency

Standard Architecture: Enterprise Infrastructure

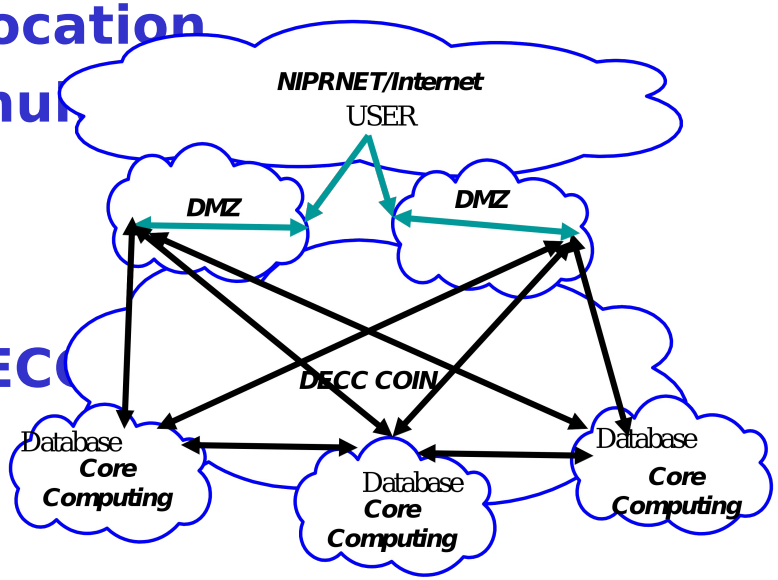
- **Increased efficiencies by establishing standards**
  - **Standard hardware platforms**
  - **Standard software products (Web, app, database, security)**
  - **Virtualization**
    - **Server, network, storage**
    - **Drives up utilization, lowers HW costs**
    - **Cost efficiencies on power, heat, space, FTE, maintenance**
  - **DoD DMZ**
  - **Business-to-business gateways**
  - **Customer collocated VPN meshes**
  - **Out-of-band management**
  - **Enterprise backup networks isolate backup traffic from production, remote management of backups**

Standards equal efficiency and lower costs

DISA
A Combat Support Agency

Standard Architecture: Information Assurance

- **Architecture is an IA initiative**
  - **All DECC traffic flows through DMZ sites**
  - **Abstracts the concept of location**
  - **Facilitates Business Continui**
  - **Successfully implemented**
- **Features and benefits**
  - **Centralized security for DEC**
  - **Global-load balancing**
  - **Application level proxies**
  - **SSL gateways**
  - **Transport encryption between all core computing facilities**



DISA
A Combat Support Agency

Standard Architecture: Systems Management

- Two communications control centers split workload geographically, either site can manage entire network
- Out-of-band management network
  - Separates system control and monitoring data from production data
- Enterprise system management
- Centralized management
- Identify and enforce security standards
  - JTF-GNO, DoD, FSO
- Virtual machine management
- Operational support teams
  - Customer aligned

DISA
A Combat Support Agency

"The Cloud"

A style of computing where massively scalable (and elastic) IT-related capabilities are provided "as a service" to external customers using Internet technologies.

What's new?

Acquisition Model: Based on purchasing of services	Business Model: Based on pay for use	Access Model: Over the Internet to ANY device	Technical Model: Scalable, elastic, dynamic, multi-tenant, & sharable

Source: Gartner

DISA
A Combat Support Agency

Enabling the Cloud Environment

- **Infrastructure**
  - Consolidation
  - Capacity Services
  - Virtualization
  - Content Delivery
  - Rapid Provisioning
- **Services**
  - Software (SaaS)
  - Applications
  - Communications
- **Processes**
  - ITIL
  - Service Level Management (SLM)
  - Security (Certification & Accreditation (C&A))

A confluence of multiple technology rivers

DISA
A Combat Support Agency

Processing & Storage as a Service

Concept

- Acquire capacity as a service provided by vendor partners
- Pay much like a homeowner pays for utilities, e.g., by CPU-hours or megabytes consumed

Processor Orders to date

- 439 total orders completed, with a $31.5M annualized value
- Average delivery timeline of 11 days
  - 14 days for mainframe; 10 for server
  - 113 orders took less than 5 days
  - 208 orders took between 5 – 14 days

Storage Orders to date

- 157 Total Orders Completed
- $9.6M Annualized Value
- Average delivery timeline of 14 Days
  - 7 Days for Disk
  - 11 Days for Network Ports
  - 24 Days for Tape Slot Capacity

Speed, Agility, Utility Pricing, Reduced Overhead & Technology Currency

DISA
A Combat Support Agency

Virtualization

- **Why? Many benefits…**
  - **Consolidation – Reduces footprint**
  - **Deployment – Eases provisioning of new workloads**
  - **Agility – Increases support for changing workload demands and simple failover situations**
  - **Protection - Lowers barriers to disaster recovery**
  - **Savings – Fewer machines means fewer administrators, less power, floor space, and cooling**
  - **Utilization - Enables multiple systems to run on high-performance hardware**
  - **Price – Reduces the cost of service delivery and lowers the total cost of ownership**
    - ***Current utilization is 15% - 20%, climbs to > 60% through virtualization***
- **Server virtualization standard environments**
  - **Windows/Linux – VMware**
  - **Solaris 10 Containers**
  - **HP-UX virtual server environment**

DISA
A Combat Support Agency

Standard Virtualized Environments

- **Windows/Linux**
  - **VMWare's ESX**
  - **Standard Configuration:**
    - **HP BL460c, 1 vCPU, 2GB Virtual Machine**
    - **Windows 2003 Server R2 Standard Edition**
    - **RedHat Enterprise Linux Standard 4.x**
- **Solaris**
  - **Moving from zones/containers to Logical Domain (LDOM)**
  - **Standard Configuration:**
    - **Sun T2000, 1 core, 4GB Logical Domain**
    - **Solaris 10**
- **HP-UX**
  - **Integrated Virtualization Manager**
  - **Standard Configuration:**
    - **HP BL860c, 2-4 core, 4GB**
    - **HP-UX 11.23**

DISA
A Combat Support Agency

zLinux Virtualization

- **First zLinux customer - Army Core of Engineers**
  - **Request for 12 Linux instances; 6 established and running**
- **DFAS Departmental Financial Reporting Reconciliation System (DFRRS)**
  - **Oracle Database was running under z/OS; now running two production instances on z/Linux**
- **DFAS MasterPin Oracle Database**
  - **Will be moving from an HPUX system to z/Linux in May 2009**
- **NAVSISA Financial and Air Clearance Transportation System (FACTS)**
  - **Letter Estimate provided to customer**
- **DISA Asset Data Management (ADM)**
  - **Being evaluated for z/LINUX in 4Q FY09**

DISA
A Combat Support Agency

Customer-Mandated Virtual Solutions

- **Our standard offerings use virtual solutions with Computing Services providing the capacity**
  - **Essential for standardization and cost control**
- **Non-standard virtual solutions (customer-owned equipment/customer-unique virtualization) leads to costly business practices such as…**
  - **Erosion of efficiencies gained through standard offerings**
  - **Delays in server rate reductions due to duplicate infrastructures**
  - **Increased staffing requirements to support stovepipe virtual solutions**
  - **Reduced solution flexibility and agility**
  - **Impeded progress on Green initiatives from continued solution sprawl**

DISA
A Combat Support Agency

GCDS, the "Enterprise Service" The WHAT, WHY, and WHO

WHAT IS GCDS?

- Type Accredited
- Distributed computing platform
- Deployed globally at the edge
- On NIPRNet and SIPRNet
- Optimizes the delivery of mission content and applications thru standards based web technologies.

WHY USE GCDS?

- Achieve up to 30 times better user performance
- Offload up to 90% of the hits from your data center infrastructure
- Meet customer expectations for faster, more secure, more reliable and richer web applications and products on the DISN.

WHO SHOULD USE GCDS?

- Global users accessing mission data over high latency networks
- Providers who are adding servers and BW to the datacenter to meet rising user demand
- Owners of applications that have low user adoption due to poor end user experience

" GCDS has made a very significant improvement in CJTF-82's ability to collaborate, share information, and disseminate information between CONUS and Afghanistan. Before GCDS units could not effectively access the information on the portal in Afghanistan." - Combined Joint Task Force 76 CONUS end user

GCDS Customers

A Combat Support Agency

DISN CLOUD	ARMY	NAVY	AIR FORCE	MARINES	DoD	Pending	TOTAL
NIPRNET	2	8	3	0	9	1	*23*
SIPRNET	2	0	1	2	15	7	*27*
TOTAL	*4*	*8*	*4*	*2*	*24*	*24*	*50*

SharePoint Portals

Intel Applications

Service Portals, Mission Applications & First Responders

eLearning Applications

Other Web Applications

Rapid Access Computing Environment (RACE)

DISA
A Combat Support Agency

Agile and responsive computing

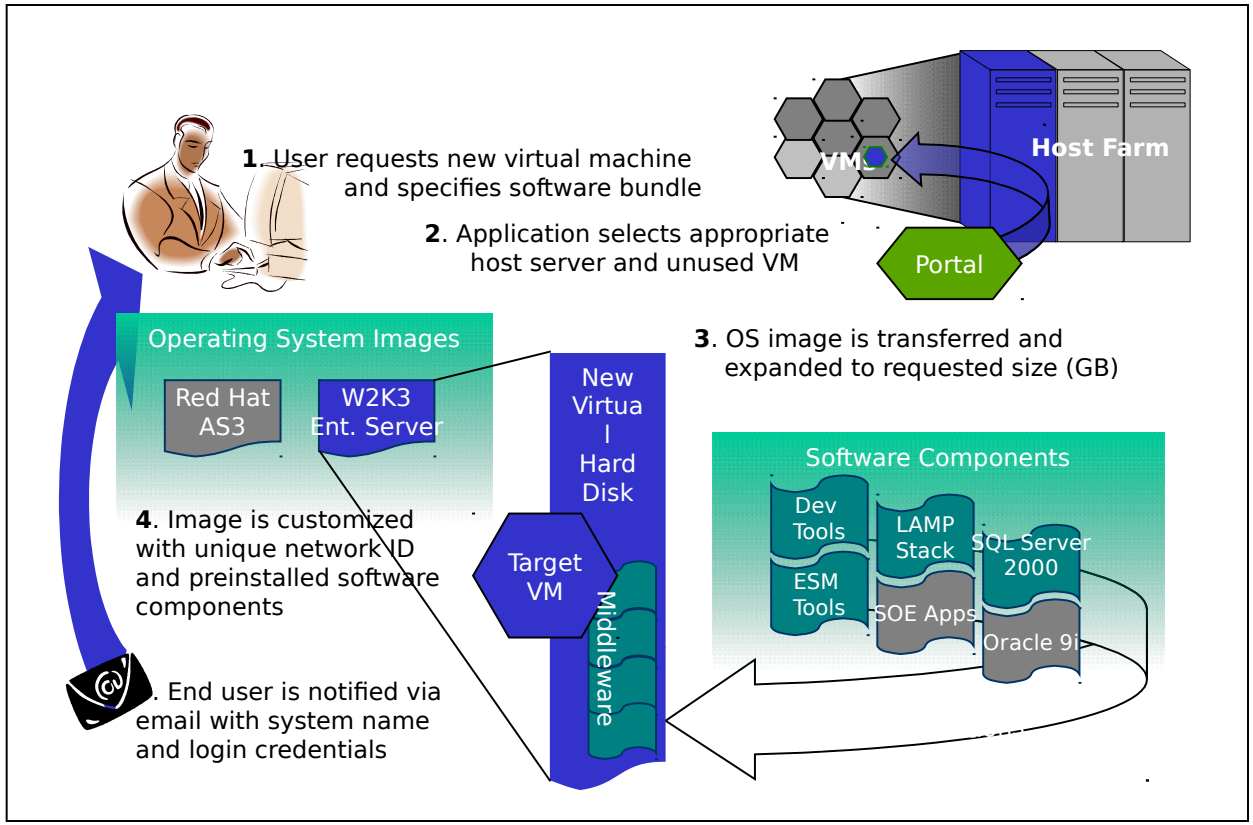
Authorized customers order and gain access to a Server in less than 24 hours

Provides flexible development platform for Web, Application or Database

Customer can purchase needed resources through Service Catalog on Web Portal; then allocate own resources, as desired

Windows, Red Hat, SUSE Servers can be created by customer in less than 30 minutes (*once all approvals are in place*)

CPU, Memory, Storage, Virtual Environment provided to customer in one simple solution


1. User requests new virtual machine and specifies software bundle
2. Application selects appropriate host server and unused VM
VM
Host Farm
Portal
Operating System Images
Red Hat AS3
W2K3 Ent. Server
3. OS image is transferred and expanded to requested size (GB)
New Virtual Hard Disk
Software Components
Dev Tools
LAMP Stack
SQL Server 2000
ESM Tools
SOE Apps
Oracle 9i
4. Image is customized with unique network ID and preinstalled software components
Target VM
Middleware
. End user is notified via email with system name and login credentials

Create your own environment – for $500/mont

RACE Capabilities Plan

A Combat Support Agency

- **Phase I - IOC 15 Oct 08**
  - Basic Security – Zone B Enclave
  - Basic system admin for provisioning
  - Server Image
    - 1 CPU
    - 1 GB Memory
    - 50 GB Storage
    - O/S – STIG'd or UnSTIG'd
  - Windows or Linux
  - LAMP stack
  - Connectivity – NIPR
  - ATO/ATC Documentation
  - DECC Standards Documentation
  - Pilot - 480 servers/images or more
- **Phase II - FY 09**
  - Higher Capacity Servers
  - Additional Optional Storage
  - Multi-tier/virtual network connectivity
  - Backup and COOP
  - Software
    - Application
    - Design Tools
    - Utilities
  - Services
    - Security
    - SA Support
    - T&D to Production support
  - Additional Zones/Enclaves
- **Expandable**
  - Add capacity to existing enclave
  - Create new enclaves for

DISA
A Combat Support Agency

Software as a Service (SaaS)

Customer Facing

- Large user baseline - continually changing and growing
- Vendor partnership
- DECC hosted
- Tier III support provided by partner
- User self-service provisioned

Supplier Facing

- Software planning and acquisition lead time challenges
- Large number of software vendors
- Large mainframe inventory
- Significant licensing complexity

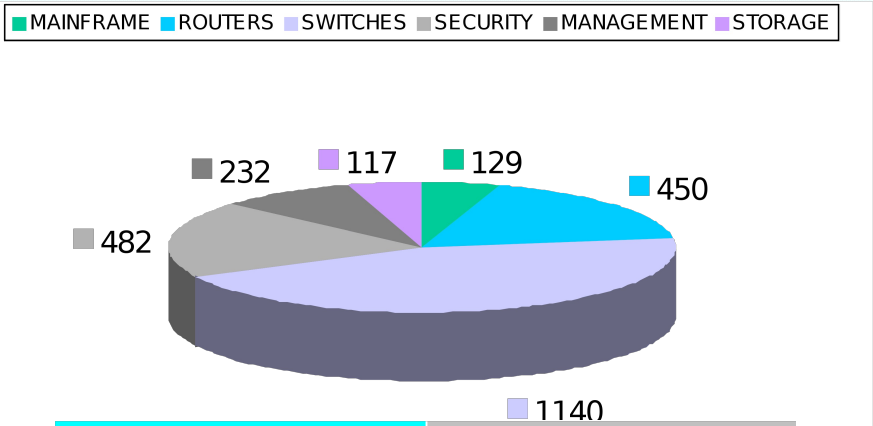
Common Characteristics and Benefits

- Software managed on “usage” basis
- Negotiated prices established
- Future versions/releases included
- Maintenance and patches provided
- Ability to rapidly grow/change/reduce baseline
- Technology infused on timely basis
- No out-year capital projections required
- Partnership with vendor(s)

DECC Communications (as as Service)

A Combat Support Agency

Communication Devices by Function



Terminal controllers	43	IDS	22
Network controllers	57	ACS	36
Channel extenders	24	DNS	32
Channel directors	5	Firewall	258
Premise	87	Crypto	81
VPN	42	Other	53
Other	321	Gigamon	32
Collocated	30	Packet capture	26
Core	53	HP Openview	46
Edge	866	Vantage	18
Content	35	Internet control	39
Backup	18	IP address mgmt	47
Other	138	Other	24
		Channel directors	69
		Channel extenders	35
		Network controllers	13

Challenge

- Keeping pace with growth
- Keeping pace with increasing security requirements
- Maintaining currency with technology

Communication Provider(s)

- Current capacity services methodology with a different commodity:
  - *Vendor retains ownership; DISA manages/operates*
- Hardware and software provided on “usage” basis
- Pricing based upon utility model
- Maintenance support/upgrades performed as required

Value Added

- Ability to rapidly change/grow baseline
- Allows technology infusion on a timely basis
- Avoids lengthy capital asset process

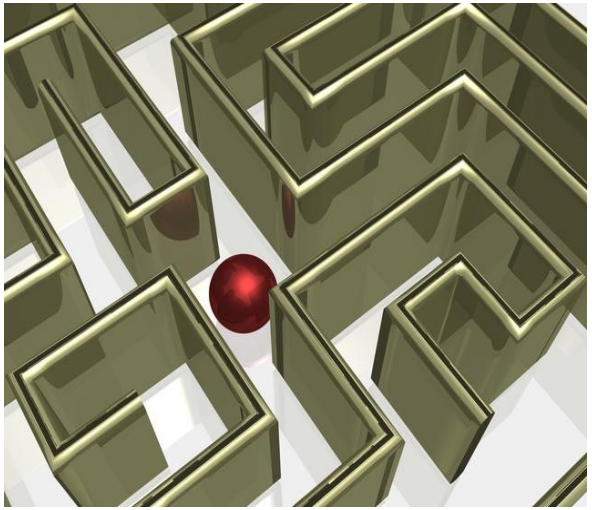
Builds upon our current capacity initiatives

Challenges and Barriers

DISA
A Combat Support Agency

Current

- Balancing Security and Usability
  - User Validation
  - Virtualization; servers, firewalls, networks
  - Access
- Business processes
  - Flexible funding; credit cards, speeding MIPR process
- Cultural inertia
  - Sharing the vision
  - Convincing “Box Huggers”
- Controlling expectations
  - “Why can’t it…..”

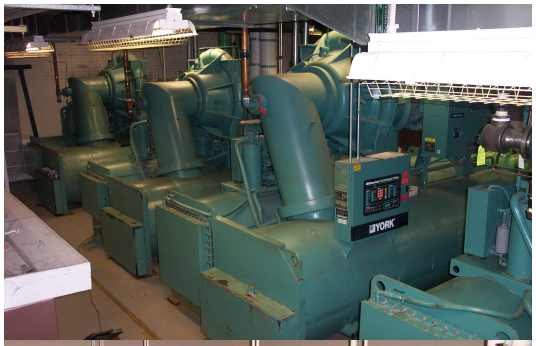


Future

- Security optimization
  - “Shared” accreditation (Reciprocity)
  - Validation of customer applications
  - Integrating Software as a Service
  - Accessing federated and shared services
- Business streamlining
  - Each Service and Agency has unique processes
  - Funding hurdles; Procurement $ verses Operating $

But Some Things *Never* Change!

DISA
A Combat Support Agency



DISA DECCs: It's also what you *DON'T* see that makes them DoD "GIG Worthy!"

- **Availability**
- **Reliability**
- **Security**
- **Scalability**
- **Connectivity**
- **Best Value**

DEFENSE INFORMATION SYSTEMS AGENCY